FORCRETE 100

Technical Data Sheet High-Build, High-Strength, Polymer-Modified, Shrinkage-Compensated Structural Repair Mortar

Description

FORCRETE™ 100 is a structural-grade, thixotropic repair mortar engineered for patching and reinstating concrete in overhead, vertical, and horizontal applications. Formulated with advanced polymer binders, fibre reinforcement, and shrinkage control additives, it offers class-leading compressive strength, high bond integrity to concrete and steel, excellent dimensional stability, and long-term resistance to chloride ingress, carbonation, and abrasion.

Packaging

- 20 kg moisture-resistant bag
- Pallet: 50 bags (1,000 kg)

Key Advantages

- ≥70 MPa compressive strength
- Vertical and overhead build: up to 100 mm in one pass
- Shrinkage-compensated – crack-resistant
- Polymer modified – enhanced adhesion and workability
- Excellent bond to concrete and reinforcement
- No formwork required
- High resistance to carbonation, chlorides, abrasion
- Suitable for hand, trowel, or spray application
- Durable in internal, external, and marine applications

Typical Applications

- Repair of damaged or spalled concrete on columns, beams, walls, and soffits
- Patching around corroded reinforcement
- Bridge decks, tunnels, marine infrastructure
- Precast defect repair and structural reinstatement
- Infrastructure exposed to impact or environmental deterioration

Properties

Compressive Strength (1 Day)	~25 MPa
Compressive Strength (7 Days)	~51 MPa
Compressive Strength (28 Days)	~70 MPa
Flexural Strength (28 Days)	~10 MPa
Tensile Bending Strength	~9 MPa
Bond Strength to Concrete	>2 MPa
Modulus of Elasticity	~26 GPa
Coefficient of Thermal Expansion	7–10 × 10^{-6} /°C
Thermal Conductivity	1.4 W/m·K
Setting Time (20°C) – Initial	~1.5 hrs
Setting Time (20°C) – Final	~2.5 hrs
Application Thickness – Horizontal	Min 10 mm / Max 180 mm
Application Thickness – Vertical	Min 5 mm / Max 100 mm
Drying Shrinkage – 7 Days	<100 microstrain (με)
Drying Shrinkage – 28 Days	<350 με
Drying Shrinkage – 56 Days	<450 με
Water Demand	3.6 L per 20 kg bag
Density (wet)	2.1 g/cm³
Freeze-Thaw Resistance	Passes ASTM C666 (300 cycles)
Shelf Life	12 months (unopened, dry conditions)

Surface Preparation

Mechanically remove all damaged, spalled, or unsound concrete. Saw cut perimeter edges to 5 mm minimum depth with 90° edges. Clean concrete to expose sound, roughened substrate (CSP 4–6). Saturate with clean water and bring to SSD (saturated surface dry) with no standing water.
Exposed steel must be cleaned to bright metal (ISO 8501-1 Sa 2.5) and primed immediately.

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Priming

ACTFLEX 300 PRIMER – General Use
Apply to all prepared concrete surfaces. Allow it to become **tacky** before applying **FORCRETE 100**.

NOTE: If dried, reapply. Avoid applying mortar over dry or overly wet primer to prevent bond failure or slumping.

ACTFLEX EP 250 – For Damp, Porous, or Immersed Areas
Use on SSD surfaces that are porous or where repairs will be exposed to moisture.

NOTE: Must be tacky, not dry. Re-prime if needed. Do not over-apply.

ZINC RICH PRIMER – Reinforcing Steel
Apply to clean, dry steel immediately after abrasive blasting.

NOTE: Do not allow contact with surrounding concrete. Acts as a bond breaker.

Mixing – Detailed Procedure

Equipment Required

Use only mechanical mixing equipment such as:

- A high-torque electric drill with a spiral or helical paddle (400–600 rpm), or
- A forced-action paddle mixer (e.g., Collomix TMX, IMER Mortarman)

Do not use free-fall drum mixers, hand mixing, or rotating barrel mixers, as these are inadequate for uniform blending of polymer-modified mortars and will result in poor strength, segregation, or inconsistent flow.

Mixing Procedure

1. **Preparation**
   Ensure the mixing vessel is clean and free from hardened residues. Pre-wet the bucket if ambient temperature exceeds 30°C.
2. **Liquid Addition**
   Measure exactly 3.6 litres of clean potable water per 20 kg bag of **FORCRETE 100**.
   For enhanced bonding and moisture tolerance, replace the water with a 2:1 mixture of clean water and ACTFLEX 300 (e.g., 2.4 L water + 1.2 L ACTFLEX 300). This improves density and adhesion to vertical substrates.
3. **Powder Incorporation**
   Begin mixing the liquid at slow speed. Gradually pour the powder into the liquid while mixing continuously. Avoid adding the powder too fast or in one dump, which may lead to clumping and dry pockets.
4. **Mixing Time**
   Mix for 3–5 minutes at medium speed until the mortar becomes smooth, uniform, and lump-free. Pause for 1 minute to allow air release, then re-mix for an additional 30 seconds. The mix should be stiff, thixotropic, and hold shape when troweled.
5. **Work Time**
   The pot life is approximately 30–40 minutes at 20°C. In warmer conditions, mix smaller quantities or cool the mixing liquid to maintain consistency.

Tip: Mix only as much material as can be placed within the working time. Do not add water after initial mixing to retemper or extend pot life.

Application – Full Instructions

Pre-Placement Checklist

- Confirm substrate is correctly primed and steel is zinc-coated.
- Confirm ACTFLEX 300 or EP 250 primers are in tacky state.
- Substrate must be SSD (saturated surface dry) with no standing water.
- Plan material quantity based on thickness, area, and working time.
- Maintain expansion joints in substrate throughout screed layer.

Step-by-Step Placement (Hand Applied)

1. **Material Placement**
   Apply **FORCRETE 100** manually using a stainless-steel trowel, pointing tool, or gloved hand.
   Begin placement from the base of the repair upward, fully pressing the mortar into the substrate and around reinforcement bars to eliminate voids and ensure intimate contact.
2. **Compaction**
   Use manual trowel pressure or light tamping to ensure the mortar fills all irregularities. Pay special attention around edges, bond lines, and embedded steel.
3. **Layering (if required)**
   For repairs exceeding 100 mm vertically or 180 mm horizontally, apply in successive layers. Allow the initial layer to stiffen but not fully cure before applying the next. Lightly scarify the surface to improve interlayer bond.
4. **Surface Finishing**
   Once the mortar begins to firm (initial set), finish using a steel float for smooth finishes or a sponge float for textured surfaces. Do not add water to the surface or overwork once initial set has begun.

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5. **Overhead Placement**
For overhead work, apply in controlled passes up to 100 mm in thickness. Ensure material is properly pressed and keyed into the substrate. Adjust mortar stiffness slightly (lower water) if needed to increase hold.

6. **Tool Maintenance**
Keep tools clean and moist during long placements. If mix begins to stiffen in the bucket, discard and mix fresh batch—do not re-temper with water.

Spray Application (Optional)

FORCRETE 100 is compatible with low-pressure mortar spray systems (e.g., wet spray method). Use equipment fitted with a variable output rotor/stator and a compressor delivering minimum 3–5 bar.

- Use a circular or flat spray nozzle with 10–14 mm aperture.
- Keep nozzle distance 30–50 cm from surface.
- Trowel finish immediately after spraying each layer.

Curing

- Immediately after finishing, apply a water-based curing compound (e.g., ACTFLEX CURESEAL), or
- Cover with damp hessian and plastic sheeting for minimum 72 hours.
- In hot, dry, or windy conditions, begin curing as soon as surface is firm enough to resist marking.

Do not allow surface to dry out in the first 24 hours.
Do not expose freshly placed material to rainfall, hose water, or traffic during the first 24 hours.

Temperature Guidelines

Low-Temperature Application
Do not apply below 5°C and falling. Use **warm water** to assist curing.

High-Temperature Application
Do not apply above 35°C. Use **chilled water** and avoid direct sunlight.

Limitations

- Do not exceed water ratio. Overwatering reduces strength and delays setting.
- Do not apply to unstable substrates; reflective cracking may occur.
- Concrete must be at least 21 days old.
- Minimum thickness is 5 mm (except localised zones).
- Use curing compound in high winds or exposed areas.
- Protect from sunlight and rain for 24 hours.
- Only apply between 5°C and 35°C.
- Use ACTFLEX EP 250 primer for immersed or wet exposure conditions.

Safety - FORCRETE™ 100

FORCRETE™ 100 is a cement-based repair mortar that may cause skin and eye irritation, allergic skin reactions, and respiratory discomfort. The product contains crystalline silica, which may cause long-term health effects including lung damage and cancer if inhaled repeatedly over extended periods. When mixed with water, the mortar becomes highly alkaline and can cause chemical burns on skin or serious eye damage if splashed.

Always wear appropriate Personal Protective Equipment (PPE), including gloves, dust-rated respirator, safety goggles, long sleeves, and safety boots. Work only in well-ventilated areas and avoid inhaling dust or contact with skin and eyes. Do not eat, drink, or smoke while handling the product. Wash hands thoroughly after use and before breaks. Change out of soiled clothing promptly.

First Aid: **Eyes**: Rinse immediately with clean water for at least 15 minutes and seek urgent medical attention. **Skin**: Wash with soap and water. If irritation occurs, consult a doctor. **Inhalation**: Move to fresh air and seek advice if symptoms persist. **Ingestion**: Do not induce vomiting. Contact a doctor or the Poisons Information Centre: **Australia**: 131 126 **New Zealand**: 0800 764 766**Transport Emergency**: Dial 000 – Police/Fire Brigade. Refer to the FORCRETE™ 100 SDS for full safety guidance.

Storage - FORCRETE™ 100

Store FORCRETE™ 100 in its original, sealed packaging in a dry, cool, and well-ventilated area. The ideal storage temperature is between **10–25°C** with low humidity. Avoid exposure to moisture and direct sunlight. Do not stack or store directly on floors—keep bags raised on pallets or waterproof racking. Bags that have become wet or damaged should not be used.

Shelf life is **12 months** from the date of manufacture when stored under recommended conditions. Always rotate stock to use the oldest material first.

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Clean-Up - FORCRETE™ 100

All tools, equipment, and mixing vessels must be cleaned **immediately after use** using clean water. Do not allow mortar to harden on equipment, as removal will require mechanical abrasion. Avoid spillage during mixing or application—FORCRETE™ 100 is difficult to remove from porous or absorbent surfaces once dried.

Do not dispose of excess product or wash water into drains, sewers, or natural waterways. Collect and contain all waste and dispose of in accordance with **local environmental regulations**.

Data Sheet

This Technical Data Sheet and the Material Safety Data Sheet (SDS) may be revised at any time to comply with relevant changes to the Australian Standards or to include changes to current technology. Always read the current SDS and TDS carefully prior to use as application and performance data may change from time to time. It is always best to request a copy of the latest technical data from Actech Protective Coatings by calling 02 8021 3517 or emailing info@forspec.com.au. Data provided is typical but does not constitute a full specification. This should be sighted from the company for specific projects.

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